IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of

Inventors: Joachim LOHR, et al.

Appln. No.: National Phase of PCT/EP2005/009386

Filed: July 31, 2006

For: EFFICIENT RISE OVER THERMAL (ROT) DURING SOFT HANDOVER

PETITION TO MAKE SPECIAL

Assistant Commissioner of Patents
Washington, DC 20231

Sir:

The Applicants respectfully petition that the above-captioned application be granted special status. The requirements of MPEP section 708.02(VIII) are complied with as follows:

(1) The petition fee set forth in 37 CFR 1.17(i) is authorized to be charged to Deposit Account No. 19-4375.

(2) All pending claims (claims 38-74) of the present application are believed to be directed to a single invention; if the Office determines that all the claims presented are not obviously directed to a single invention, the Applicants agree to make an election without traverse as a prerequisite to the grant of special status.

(3) A pre-examination search has been made in the form of a search report in a counterpart PCT International Application (International Search Report dated November 23, 2005). Under MPEP 708.02, VIII, a search made by a foreign patent office satisfies the search requirement. An Information Disclosure Statement directed to the references cited in the ISR is filed concurrently herewith.

Also, a pre-examination search has been made, and the attached Information Disclosure Statement includes results thereof. The field of search is:

Class 370, subclasses 278, 282, 328, 331, 335, 339, 342, 437, 441, and 468;

Class 455, subclasses 436, 437, 438, 439 and 442; and

Class 709, subclasses 220221 and 229.

Examiner John Pezzlo was consulted for the above field of search.

(4) One copy each of the prior art deemed most closely related to the subject matter encompassed by the claims is of record in the form of the art cited in the Information Disclosure Statement filed herewith.

(5) The following is a detailed discussion of the art of record, and comments pointing out how the instant claimed subject matter is patentably distinguishable thereover.

A. Discussion of All References of Record

D. Chase: "Code combining: A maximum-likelihood decoding approach for combining an arbitrary number of noisy packets", IEEE Transactions on Communications, Col. COM-33, pages 385 to 393, May 1985 discussed at application page 2, last paragraph states that in chase-combining, retransmission packets carry identical symbols, and multiple received packets are combined either by a symbol-by-symbol or by a bit-by-bit basis and are stored in the soft buffers of respective HARQ processes.

3GPP TR 25.401, "UTRAN Overall Description" discussed at application page 4, first full paragraph, discloses the high level R99/4/5 architecture of Universal Mobile Telecommunication System (UMTS), as shown in application Fig. 1.

3GPP TR 25.897: "Feasibility Study on the Evolution of UTRAN Architecture", V.0.2.0, discussed at application page 4, last full paragraph, discusses an evolved UMTS UTRAN architecture in which each of the new network elements may be defined in terms of its control and user plane functions. An overview of the network architecture is given in the Fig. 9. The RNG (Radio Network Gateway) is used for interworking with the conventional RAN, and to act as a mobility anchor point meaning that once an RNG has been selected for the connection, it is retained for the duration of the call. This includes functions both in control plane and

user plane. Further, the RNG provides connectivity to the core network of the mobile communication system.

3GPP TR 25.896, "Feasibility Study for Enhanced Uplink for UTRA FDD (Release 6)" discussed at application page 6, third full paragraph, discusses uplink enhancements for Dedicated Transport Channels (DTCH).

3GPP TSG RAN WG1, meeting #31, Tdoc R01-030284, "Scheduled and Autonomous Mode Operation for the Enhanced Uplink" discussed at application page 7, second full paragraph, describes a new MAC sub-layer called MAC-e.

3GPP TSG RAN WG 1, meeting #31, "HARQ Structure", Tdoc R1-030247, is discussed at application page 8, second full paragraph. Every MAC-e entity corresponds to a user (UE), and application Fig. 6 depicts the base station (Node B) MAC-e architecture. Fig. 7 shows the S-RNC MAC-e architecture which comprises the reordering buffer of the corresponding user (UE). The number of reordering buffers is equal to the number of data flows in the corresponding MAC-e entity on the UE side. Data and control information is sent from all Node Bs within the active set to S-RNC during soft handover.

3GPP TR 25.896, "Feasibility study for Enhanced Uplink for UTRA FDD (Release 6)" is discussed again at application page 11, fist full paragraph. Due to Node B being unaware of the number of

UEs transmitting at the same time, no precise control of the uplink noise rise in the cell may be possible.

3GPP TS 25.321, "Medium Access Control (MAC) Protocol Specification; (Release 6)", version 6.1.0, is discussed at application page 14, last full paragraph, and gives details of the UMTS TFC selection procedure.

USPN 5,914,950 relates to uplink rate scheduling in a variable data transmission rate system. Plural remote stations communicate with plural base stations, and a given remote station communicates with more than one base station depending upon whether the remote station is in a soft handover. When a remote station has a large amount of data to transmit to the cell, a channel scheduler collects information on *inter alia* how much data is to be transmitted and the available uplink capacity for each cell in the network. The channel scheduler assigns the maximum scheduled transmission rate, which is based on the reverse link capacity available for each cell and on the priority of a scheduled user, and sends the maximum scheduled transmission rate to the user. Users within the system are assigned a priority based on factors including re-transmitted data, data time-sensitivity, soft handoff determination, energy-per-bit required by the user for a requisite level of performance, the list of cells supporting the user, the amount and type of data to

be transmitted, the type of data service being provided to the user, and the amount of delay already experienced by the user. The available capacity is allocated to the highest priority user first and the lowest priority user last.

USPN 6,414,947 discloses a soft handover technique in a CDMA cellular radio system in which two base stations each include a resource allocator and a communication section for communicating over a radio interface to a user terminal. The user terminal is in soft handover with the two base stations and communicates using packet transmission. One of the base stations is designated as an "associated" base station. Initial resource scheduling is performed with respect to the cell of this associated base station, and a first allocation of resource is made to the afroementioned user terminal. The resource allocation is then communicated to the "non-associated" base station for use with the aforementioned user terminal.

EP 0935401 relates to soft handover in a wireless system which includes a mobile switching center with a selection/distribution unit (SDU). The reference discloses a technique for reconciling frame error rates among base stations during soft handover. The SDU receives a frame error rate (FER) setting from a first base station, and receives a requested FER

setting from a second base station. The SDU determines a least restrictive FER setting, and

applies the least restrictive FER setting to a call. The SDU may extend an applied FER setting message to all base stations participating in the soft handover.

US 2003/133415 discloses calculating an available maximum data rate for a reverse supplemental channel (R-SCH) in each of the base stations (BTSs) communicating with the mobile station (MS) via a base station controller (BSC), if the MS handoffs between the BTSs with the R-SCH assigned. The lowest of the maximum data rates is selected as the data rate of the R-SCH. The BSC notifies all of the BTSs of the selected data rate as the data rate of the R-SCH. The MS is notified of the selected data rate as the data rate of the R-SCH for each of the BTSs.

US 2004/109424 discloses a method for selecting a BTS for scheduling a reverse link communication. A base station rise over thermal (ROT) value is determined and transmitted over a common or a dedicated channel to a user terminal. The user terminal provides parameters including amount of data to be transmitted and transmitted power level. The user terminal measures signal and noise related measurements. The user terminal provides a ROT value which is a ROT value selected by the user terminal from a group of ROT values received from base

stations with which the user terminal is in communication. One of the user terminal provided ROT value or the base station ROT value is selected for scheduling a reverse link communication. Scheduling the reverse link communication from the user terminal includes evaluating the selected ROT value, a user terminal's specific parameters including an amount of data that the user terminal seeks to transmit and the user terminal's reverse link power level.

US 2005/0048975 is directed to a method for use by a UE and plural Node Bs of a wireless telecommunication system for enabling Node B based control during soft handover of the maximum data rate allowed for uplink by the UE. The node B controlled scheduling includes a synchronization process carried out so as to set to a same value a pointer used by a new scheduler Node B to indicate the maximum allowed uplink data rate and a corresponding pointer used by the UE.

US 2004/0219919 is directed to management of uplink scheduling modes including a first mode in which the wireless communication device schedules uplink transmissions and a second mode in which a base station schedules uplink transmissions. In one aspect, the wireless communication device is in communication with a number of base stations in a soft handoff situation and a network control element acts to ensure that all base stations

correspond to the current scheduling mode employed by the wireless communication device.

US 2005/201337 discloses a system and method for retransmitting uplink data according to a radio channel environment of a UE in a CDMA communication system. The technique includes transmitting uplink data for a transmission time interval of a first length, if a UE is located in a non-soft handover region; and transmitting the data for a transmission time interval of a second length, if the UE is located in a soft handover region.

US 2006/034216 discloses a method for transmitting ACK/NAK signals from a network receiving packet data transmitted from a UE through an uplink data channel. In this system, transmission powers for downlink ACK/NAK signals are optimized in accordance with the required reception quality of each of the ACK/NAK signals, and thus, enables the system to operate efficiently.

B. Discussion of How the Claimed Invention Patentably Distinguishes over the References of Record

It is submitted that the references cited above, considered either alone or in combination, fail to disclose or suggest at least the subject matter of independent claims 38, 61, 65, 67, 70 and 74 of:

(a) communicating information relating to scheduling of uplink data transmissions wherein (1) during soft handover, a first mobile terminal transmits data on the uplink to plural base stations, (2) at least one base station (scheduling base station) of the plural base stations schedules uplink data transmissions of the first mobile terminal in soft handover, (3) the scheduling base station determines scheduling information indicative of an allocated maximum amount of uplink resources, and (4) at least one other base station of the plural base stations is informed of the allocated maximum amount of uplink resources and schedules at least one other mobile terminal in communication with a respective base station using the indicated maximum amount of uplink resources allocated to the first mobile terminal in soft handover (claims 38 and 61).

(b) a base station communicating information relating to scheduling of uplink data transmissions wherein (1) during soft handover, a first mobile terminal transmits data on the uplink to plural base stations, (2) the base station includes a processing unit that determines scheduling information indicative of an allocated maximum amount of uplink resources, and (3) the base station includes an informing unit that informs at least one other base station of the plural base stations of the allocated

maximum amount of uplink resources for use in scheduling at least one other mobile terminal (claim 65).

(c) a radio resource controller communicating information relating to scheduling of uplink data transmissions wherein (1) during soft handover, a first mobile terminal transmits data on the uplink to plural base stations, (2) the radio resource controller includes a receiver that receives a maximum amount of resources allocated to the mobile terminal in soft handover from at least one base station of the plural base stations, and (3) the radio resource controller includes a transmitter that signals the received maximum amount of resources allocated to the mobile terminal in soft handover to at least one other base station of the plural base stations for use in scheduling at least one other mobile terminal (claim 67).

(d) communicating information relating to scheduling of uplink data transmissions wherein (1) during soft handover, a first mobile terminal transmits data on the uplink to plural base stations, (2) at least a subset (scheduling base station) of the plural base stations schedules uplink data transmissions of the first mobile terminal in soft handover, (3) the first mobile terminal receives scheduling information indicative of an allocated maximum amount of resources allocated to the mobile terminal from the subset of base stations, (4) the mobile station

chooses a maximum amount of resources for uplink data transmissions to the plural base stations based on the received maximum amount of resources, and (5) the system indicates to the plural base stations the chosen maximum amount of resources or a chosen maximum power ratio of uplink data transmission (claims 70 and 74).

Various references of record disclose soft handover schemes, such as USPN 5,914,950 which determines available uplink capacity for each cell in the network and a channel scheduler assigns the maximum scheduled transmission rate, which is based on the reverse link capacity available for each cell and on the priority of a scheduled user. USPN 6,414,947 discloses a soft handover technique in a CDMA cellular radio system in which two base stations communicate with a user terminal. Initial resource scheduling is performed with respect to a cell of one of the base stations, and a first resource allocation is made to the user terminal. This resource allocation is communicated to the other base station for use with the same user terminal. EP 0935401 relates to soft handover in a wireless system which includes a mobile switching center with a selection/distribution unit (SDU) which may extend an applied FER setting message to all base stations participating in a soft handover. US 2003/133415 discloses soft handover in which a BSC notifies all of the BTSs

of a selected data rate as the data rate of the R-SCH. The MS is notified of the selected data rate as the data rate of the R-SCH for each of the BTSs. However, the references of record, considered alone or together, fail to teach or suggest the claimed subject matter of (claims 38, 61, 65 and 67), *inter alia*, informing at least a second base station among plural base stations of an allocated maximum amount of uplink resources determined by a first base station for a first mobile terminal and scheduling at least a second mobile terminal in communication with a respective base station using the indicated maximum amount of uplink resources allocated to the first mobile terminal in soft handover. Further, the references of record, considered alone or together, fail to teach or suggest the claimed subject matter of (claims 70 and 74) of, *inter alia*, a first mobile terminal that (i) receives scheduling information indicative of an allocated maximum amount of resources allocated to the mobile terminal from a subset of base stations and (ii) chooses a maximum amount of resources for uplink data transmissions to the plural base stations based on the received maximum amount of resources, wherein an indication is provided to the plural base stations of the chosen maximum amount of resources or a chosen maximum power ratio of uplink data transmission. It is submitted that there is nothing in the combined teachings of these

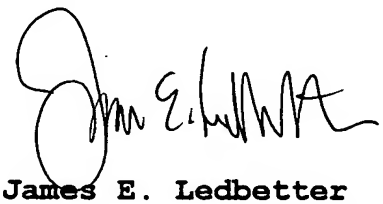
references that would have rendered such subject matter obvious to those skilled in the art.

Thus, the Applicants submit that the above-noted combinations of features of the independent claims are not taught or suggested by the combined teachings of the art of record, and thus the independent claims, and all claims dependent therefrom, are patentable.

Accordingly, in light of the foregoing discussion pointing out how the claimed invention distinguishes over the cited references, the Applicants respectfully submit that the inventions of all the presently pending claims are not anticipated by these references and would not have been obvious over any combination thereof.

Grant of special status in accordance with this petition is respectfully requested.

Respectfully submitted,



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